GE Hitachi
Nuclear Energy

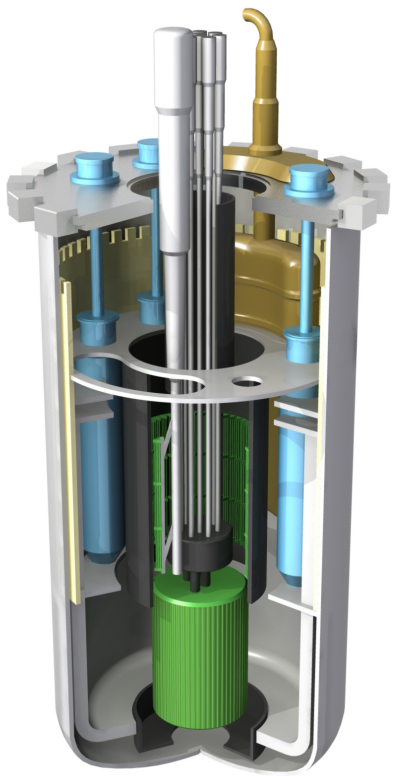
PRISM

Elegantly Simple, Passive, Modular, and Environmental

Technology Update

GE Hitachi Nuclear Energy's (GEH) next evolution of sodium-cooled reactor technology is the PRISM (Power Reactor Innovative Small Modular) reactor. The PRISM is a reactor that uses liquid sodium as a coolant. This coolant allows the neutrons in the reactor to have a higher energy (sometimes called fast-reactors) that drive fission of the transuranics, converting them into short-lived "fission products." This reaction produces heat energy, which is converted into electrical energy in a conventional steam turbine.

The dynamics of the sodium-cooled reactor make it well suited for consuming transuranics in used nuclear fuel from today's water-cooled reactors. Sodium-cooled reactors are well-developed and have safely operated at many sites around the world. GEH's simplified design provides improved safety, excellent economics, factory construction, a broad seismic isolation design envelope, and operational flexibility that increases plant availability.



The PRISM reactor builds on sodium-cooled reactor experience and employs passive safety design features. It is a simplified reactor design, allowing factory fabrication with modular construction and ultimately lower costs.

To further build on previous work documented in NUREG-1368, GEH is currently in the process of drafting a Design Control Document to better understand the licensing process for the GEH-designed Gen IV PRISM reactor.

GEH is ready to support the DOE and utilities looking to build a GEN IV nuclear power plant to close the nuclear fuel cycle.

Benefits and Features of the PRISM

- Simplified design
  - Residual heat transferred to the atmosphere
  - Active safety systems eliminated
  - Pumps without moving parts; valves and motors eliminated from previous nuclear island designs
- Passive design features, such as passive reactor core cooling, eliminate the active systems and increase safety
- Expedited construction schedule due to pre-licensed design, standardized construction modules, and factory fabrication
- Enables complete recycling of plutonium and most nuclear waste

PRISM QUICK FACTS

- PRISM is an evolutionary design based on the EBR-II reactor and over 30 years of safe operating experience
- One PRISM power block generating 622 MWe—replacing the same amount of electricity generated in the U.S. through traditional sources—would reduce annual greenhouse gas emissions by an amount equivalent to taking 700,000 cars off the road while at the same time consuming used nuclear fuel.

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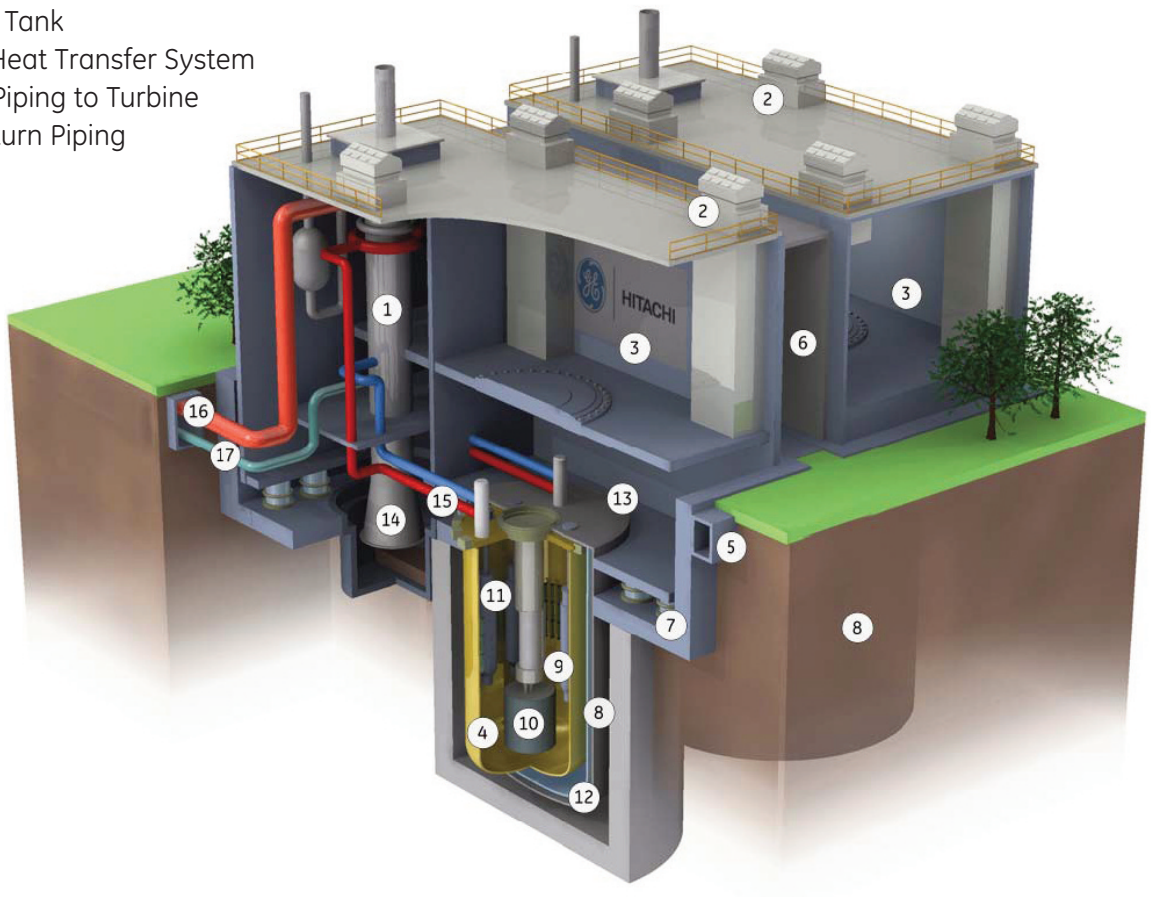
PRISM Power Block

1. Steam Generator
2. Reactor Vessel Auxiliary Cooling System (RVACS) Stacks (8)
3. Refueling Enclosure Building
4. Vessel Liner
5. Reactor Protection System Modules
6. Electrical Equipment Modules
7. Seismic Isolation Bearing
8. Reactor Module (2), 311 MWe Each
9. Primary Electromagnetic Pump (4 per module)
10. Reactor Core
11. Intermediate Heat Exchangers (2)
12. Lower Containment Vessel
13. Upper Containment Building
14. Sodium Dump Tank
15. Intermediate Heat Transfer System
16. Steam Outlet Piping to Turbine
17. Feedwater Return Piping



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